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# **WATER SUPPLY OUTLOOK FOR WESTERN UNITED STATES**

**Including Columbia River Drainage in Canada**



**U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE**

Collaborating with  
**CALIFORNIA DEPARTMENT of WATER RESOURCES**  
and  
**BRITISH COLUMBIA DEPARTMENT of**  
**LANDS, FORESTS and WATER RESOURCES**

AS OF  
**MAY 1, 1977**

## TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

COVER PHOTO: SNOW COURSE MEASUREMENTS BY A SURVEY TEAM IN UTAH'S WASATCH RANGE.  
ORC-254-10

### PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 510, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	Room 129, 2221 East Northern Lights Blvd., Anchorage, Alaska 99504
Arizona	Room 3008, 6029 Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1220 S.W. Third Ave., Portland, Oregon 97204
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 84138
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82602

### PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



# **WATER SUPPLY OUTLOOK FOR WESTERN UNITED STATES**

**Including Columbia River Drainage in Canada**

ISSUED

MAY 1, 1977

The Soil Conservation Service coordinates snow surveys conducted by its staff and many cooperators, including the Bureau of Reclamation, Corps of Engineers, Forest Service, National Park Service, NOAA, National Weather Service, Geological Survey, and other Federal Agencies, Departments of State Government, Irrigation Districts, Power Companies, and others.

The Department of Water Resources coordinates snow surveys in California.

The Water Resources Service, Department of Lands, Forests, and Water Resources directs snow surveys in British Columbia.

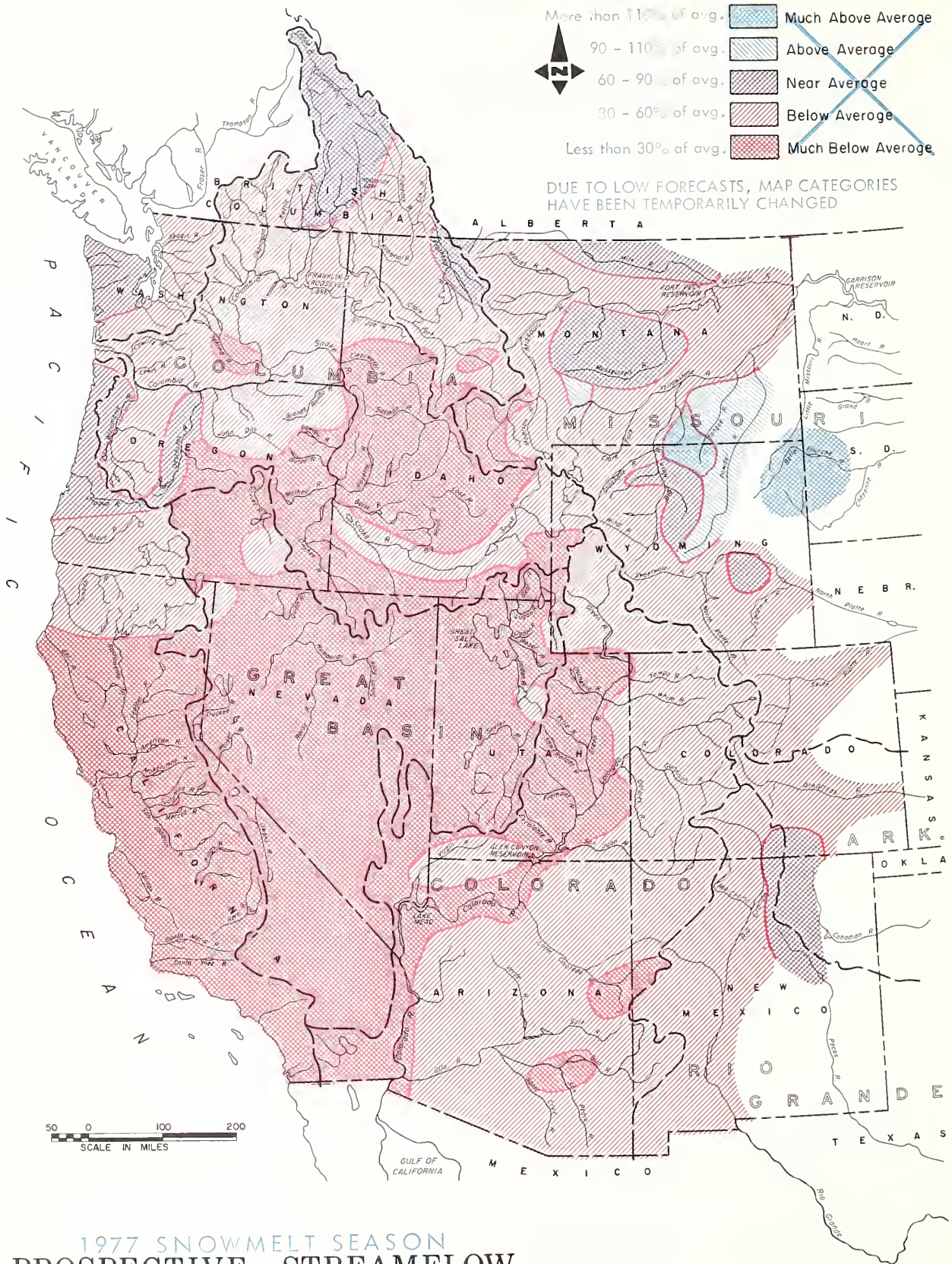
This report was prepared by the Water Supply Forecasting Unit, Engineering Division, Soil Conservation Service, from data supplied by Snow Survey Supervisors of the Soil Conservation Service in the States of Alaska, Arizona, Colorado and New Mexico, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

Data from California was supplied by the Chief, Water Supply Forecast and Snow Survey Unit, Department of Water Resources.

Data from British Columbia was supplied by the Chief, Hydrology Division, Water Investigations Branch, Department of Lands, Forests and Water Resources.

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
R.M. DAVIS, ADMINISTRATOR







# WATER SUPPLY OUTLOOK

1977 SNOWMELT SEASON  
MAY 1, 1977

NO RELIEF IN THE DROUGHT WAS RECEIVED DURING APRIL, AS WARM, DRY WEATHER PREVAILED. LITTLE SNOW REMAINS ON MOST OF THE WEST'S MOUNTAIN RANGES, AND SNOWMELT RUNOFF WILL BE LESS THAN ANY YEAR THIS CENTURY.

Widespread severe water shortage continues to be forecast for much of the West this summer. The record minimum spring and summer runoff which is forecast from most of the rivers in the region will not be enough to meet the demands unless heavy and frequent summer rains are received.

Warm, dry weather in April triggered the melting of mountain snowpacks as much as 30 days earlier than normal, which rapidly depleted the record low snowpack of 1 month ago. By May 1, very little snow remained at most low and mid elevations. The high country pack is much lighter than normal, but is not yet melting rapidly.

Melt water is being absorbed by abnormally dry watershed soils. As a result, many streams have reached their runoff peaks and are receding. Reservoirs which normally would be filling with the spring freshets are, instead, being lowered by heavy irrigation demands.

Throughout most of the West the very shallow snowpack was at a record low level on February 1, March 1, and April 1. This last survey period of the season, May 1, was no exception. Many data sites had no snow, and those that did have some snow had record low amounts.

Reservoir storage did not increase in the normal amount during April. California and Nevada impoundments continue to be most deficient as the drought in that region is in its second year.

The snowmelt runoff forecast for the Columbia River has been revised downward from 1 month ago, and is now expected to be at a 99-year low of only 49 percent of normal. The Snake River is expected to contribute only about one-third of its normal amount. Many smaller Idaho and Oregon tributaries to the Columbia are forecast to yield as little as 10 to 25 percent of average.

The snowpack is almost entirely melted from the Sierra Nevada, with no more than 5 percent of the normal May 1 level remaining on the California side. Central Valley rivers are forecast to flow at rates only 5 to 18 percent of average, except for the Sacramento, which is predicted to provide 39 percent of its normal inflow into Shasta

reservoir. Those streams flowing eastward from the Sierra into the state of Nevada will also be very low this summer. Forecasts indicate that these streams will yield only 10 to 25 percent of their averages.

The Colorado river basin conditions deteriorated again during April. Inflow to Lake Powell is forecast to be only 25 percent of normal. The most severe tributary condition is on the Duchesne, where only 1 percent of the normal flow is forecast at the Randlett gaging station. The Green River will contribute about 30 percent of normal and the Gunnison about 34 percent. The Roaring Fork and White Rivers, heading in Colorado, are expected to yield nearly one-half of average.

Streams in the Platte, Arkansas, and Rio Grande basins are expected to flow at rates of from about 40 to 60 percent of average. These yields are near the record low flows. Reservoir storage is near normal along the Platte and Rio Grande but quite deficient on the Arkansas.

Conditions in the upper Missouri River basin are quite variable, and range from slightly above normal in the Big Horn range to only 7 percent of normal from the Beaverhead River in Montana. Most rivers are forecast to yield from 40 to 70 percent of average. Reservoir storage is generally adequate to supplement the low streamflow yields.

The Great Basin of Nevada and Utah will receive much below normal runoff. As indicated above, the yields from Sierra Nevada streams will be very low. The Humboldt River is forecast to run at only 7 percent of its normal. The Bear River is expected to yield only 6 percent. Elsewhere in the basin, most streams are forecast to contribute from 10 to 30 percent. Reservoir storage is generally good in Utah, but only about one-half of normal in Nevada.

The above-referenced streamflow forecasts all indicate severe water supply shortages throughout the West. Reservoir storage is near the May 1 average in most river basins, with the most notable exceptions in California, Nevada, and along the Arkansas River. In a more normal year reservoir storage improves during the spring and early summer freshet period. However, this year

# SUMMARY OF SNOW WATER EQUIVALENT MEASUREMENTS

MAJOR BASIN AND SUB - WATERSHED	WATER EQUIVALENT IN PERCENT OF:		MAJOR BASIN AND SUB - WATERSHED	WATER EQUIVALENT IN PERCENT OF:	
	LAST YEAR	AVERAGE		LAST YEAR	AVERAGE
MISSOURI BASIN			SNAKE BASIN		
Jefferson	19	25	Snake above Jackson, Wyo.	13	18
Madison	18	23	Snake above Hiese, Idaho	12	17
Gallatin	41	47	Henry's Fork	8	10
Missouri Main Stem	37	44	Southern Idaho Tributaries	10	13
Yellowstone	38	47	Big and Little Wood	9	9
Shoshone	9	15	Boise	4	4
Wind	21	24	Owyhee	0	0
North Platte	80	86	Payette	5	5
South Platte	55	49	Malheur	0	0
ARKANSAS BASIN			Weiser	-	-
Arkansas	38	30	Burnt	0	0
Cucharas - Purgatoire	51	33	Powder	1	1
RIO GRANDE BASIN			Salmon	7	8
Rio Grande (Colo.)	19	23	Grande Ronde	12	14
Rio Grande (New Mexico)	-	-	Clearwater	30	30
Pecos	-	-	LOWER COLUMBIA BASIN		
COLORADO BASIN			Yakima	26	12
Green (Wyo.)			Umatilla	0	0
Yampa - White	24	20	John Day	0	0
Duchesne	0	0	Deschutes - Crooked	11	15
Price	0	0	Hood	14	25
Upper Colorado	43	35	Willamette	20	30
Gunnison	15	14	Lewis	26	32
San Juan	15	20	Cowlitz	36	32
Dolores	17	13	PACIFIC COASTAL BASIN		
Virgin	0	0	Puget Sound	28	32
Gila	-	-	Olympic Peninsula	25	32
Salt	-	-	Umpqua - Rogue	23	17
Verde	-	-	Klamath	4	5
GREAT BASIN			Trinity	5	5
Bear	9	9	CALIFORNIA		
Logan	8	9	CENTRAL VALLEY		
Ogden	0	0	Upper Sacramento	5	5
Weber	18	17	Feather	15	5
Provo - Utah Lake	5	5	Yuba	15	5
Jordan	9	8	American	20	5
Sevier	-	13	Mokelumne	15	5
Walker - Carson	18	3	Stanislaus	15	5
Tahoe - Truckee	30	9	Tuolumne	15	5
Humboldt	11	13	Merced	15	5
Lake Co. (Oregon)	0	0	San Joaquin	25	5
Harney Basin (Oregon)	0	0	Kings	20	5
Owens	25	5	Kaweah	20	5
UPPER COLUMBIA BASIN			Tule	0	0
Columbia (Canada)	51	58	Kern	50	5
Kootenai	39	40	Data for California Watersheds supplied by Dept. of Water Resources, and for British Columbia Watersheds by Dept. of Lands, Forests and Water Resources.		
Clark Fork	24	27			
Bitterroot	25	31	Average is for the 1958-72 period. California averages are for the period 1931-70. Based on Selected Snow Courses determined by Distribution within the Basin, Length of Record and Re- petitive Monthly Measurement Schedules.		
Flathead	43	41			
Spokane	27	26			
Okanogan	26	25			
Methow	23	26			
Chelan	36	49			
Wenatchee	17	22			



the rise in river flow due to melting snow has been so small that little, if any, improvement in reservoir storage is anticipated.

In the face of this expected widespread shortage, the Soil Conservation Service urges that water conservation be practiced wherever possible to help lessen the effects of the drought. Water Conservation "TIPS" brochures which give conservation hints for crops and soils, pasture and range, irrigation, and yards and gardens can be obtained from your local Soil Conservation Service or Conservation District office.

The "Prospective Streamflow" map, on the opposite page, has been changed again for this issue of the "Water Supply Outlook" to illustrate more clearly the runoff picture. The reader is directed to the legend headings printed in blue for an explanation of the map categories.

The back cover of this bulletin is designed to be removed and returned to indicate the reader's interest in receiving the publication. Federal regulations require that this inquiry be made of recipients of free government bulletins. The front cover "fly sheet" is designed to be torn off and destroyed at the time the back cover is detached, signed, folded, and mailed.

## ALASKA

A very heavy snowpack covers most of Southcentral Alaska while in striking contrast a lean snow belt exists between the Alaska Range and the Yukon River. Snow in the Brooks Range is significantly above normal and the Yukon River headwaters in Canada are a little below normal. The Juneau area of Southeast is just about average for May 1.

A record heavy snowpack exists in the Kenai, Chugach, and St. Elias Mountains. At one course bordering Prince William Sound, the pack measured 34 feet deep with better than 15 feet water content. The remainder of the region south of the Alaska Range is less imposing with snow cover averaging only 30 to 60 percent above normal. Snowmelt runoff volumes will be heavy as typified by the forecast for Ship Creek near Anchorage where streamflow for the April-July period is expected to exceed the norm by 54 percent.

The Fairbanks-Chena River area is about center and typical of the low snow region. Here the snowpack averages 30 percent below normal with the Chena River flow about the same.

## ARIZONA

Snowmelt has progressed normally in the state, with only a little left at the higher elevations. Most rivers have receded to near base flow levels. April weather has not altered the water supply outlook. It is still anticipated that supplies will be adequate for most irrigation projects served by reservoir storage. Snow surveys are not made on May 1 in Arizona, since the snowpack season is normally ended by this date.

## CALIFORNIA

The California Department of Water Resources, coordinating agency for snow surveys and water supply forecasting in California, reports that April was the seventh consecutive month of below average precipitation and 1977 can now be firmly classified as the driest year of record in California. The task now before all water agencies is to provide at least a minimal supply of water for essential requirements. This report contains information on the water supply conditions as of May 1, and may be used as a base from which to prepare contingency plans for this summer, and to estimate carryover water storage amounts for 1978.

Forecasts of runoff have been reduced from those presented 1 month ago as a result of below normal precipitation during April and because some of the meager snowmelt has been retained by mountain soils. Record low April-July and water year flows are forecasted for all major streams of the Central Valley and Lahontan area.

Snowpack measurements of water storage, based on May 1 snow surveys, show that only the higher elevations still retain some snow. In normal years about 70 percent of the seasonal snow accumulation would still be available on May 1 for snowmelt runoff. This year only 5 percent of a normal season's accumulation of water content remains. Most courses below 9,000 feet (2,740 metres) are bare. The snowmelt period for this year began in late March and will be essentially completed early in May.

Precipitation during April was 10 percent of average over the state. Water year precipitation, October 1 through April 30, has been 30 percent of average. With the precipitation season nearly over, this value will change very little by the time the 1976-77 water year ends on September 30.

# SELECTED STREAMFLOW FORECASTS

May 1, 1977

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
SASKATCHEWAN				
St. Mary near Babb, Montana <u>1/</u>	285	61	May-Sept.	468
UPPER MISSOURI				
Beaverhead near Grant, Montana <u>2/</u>	7	7	May-Sept.	106
Big Hole near Melrose, Montana	190	29	May-Sept.	665
Madison near Grayling, Montana <u>3/</u>	255	53	May-Sept.	425
Gallatin near Gateway, Montana	300	59	May-Sept.	507
Sun at Gibson Dam, Montana <u>4/</u>	240	43	May-Sept.	556
Belt near Monarch, Montana	98	85	May-Sept.	115
Marias near Shelby, Montana <u>5/</u>	145	30	May-Sept.	486
Missouri near Landusky, Montana <u>6/</u>	1,500	36	May-Sept.	4,150
near Williston, North Dakota <u>7/</u>	4,150	40	May-Sept.	10,352
S.Fk. Musselshell above Martinsdale, Montana	34	78	May-Sept.	44
Milk at Eastern Crossing, Montana	155	70	May-Sept.	221
Yellowstone at Yellowstone Lake Outlet, Wyo.	375	46	April-Sept.	955
at Corwin Springs, Montana	1,080	56	May-Sept.	1,915
at Miles City, Montana <u>8/</u>	2,750	46	May-Sept.	5,931
Clarks Fork near Belfry, Montana	320	55	May-Sept.	586
Shoshone below Buffalo Bill Res., Wyo. <u>9/</u>	420	51	April-Sept.	1,037
Wind near Dubois, Wyoming	47	46	April-Sept.	146
at Riverton, Wyoming <u>10/</u>	250	38	April-Sept.	736
below Boysen Res., Wyoming <u>11/</u>	400	40	April-Sept.	1,006
Bull Lake Creek near Lenore, Wyoming	110	60	April-Sept.	178
Little Popo Agie near Lander, Wyoming	26	54	April-Sept.	40
Tensleep near Tensleep, Wyoming	51	65	April-Sept.	
Medicine Lodge near Hyattville, Wyoming	13	62	April-Sept.	
Shell Creek near Shell, Wyoming	65	89	April-Sept.	85
Big Horn near St. Xavier, Montana <u>8/</u>	450	26	May-Sept.	1,724
Tongue near Dayton, Wyoming	130	115	April-Sept.	108
No. Fork Powder near Hazelton, Wyoming	9.5	95	April-Sept.	11.1
PLATTE				
North Platte at Northgate, Colorado	144	60	April-Sept.	163
Encampment near Encampment, Wyoming	60	43	April-Sept.	142
Deer Creek at Glenrock, Wyoming	20	77	March-July	36
Laramie Riv. & Pioneer Canal, nr Woods, Wyo. <u>12/</u>	56	44	April-Sept.	101
Big Thompson at Drake, Colorado <u>13/</u>	45	42	April-Sept.	
Clear at Golden, Colorado <u>14/</u>	55	43	April-Sept.	
St. Vrain at Lyons, Colorado <u>15/</u>	30	40	April-Sept.	
Cache LaPoudre near Fort Collins, Colorado <u>16/</u>	110	45	April-Sept.	
ARKANSAS				
Arkansas at Salida, Colorado <u>17/</u>	150	50	April-Sept.	
Cucharas near LaVeta, Colorado	8	80	April-Sept.	
Purgatoire at Trinidad, Colorado	23	61	April-Sept.	
RIO GRANDE				
Rio Grande near Del Norte, Colorado <u>18/</u>	230	49	April-Sept.	
at Otowi Bridge, New Mexico <u>19/</u>	215	41	March-July	
Conejos near Mogote, Colorado <u>20/</u>	85	46	April-Sept.	
El Vado Res., Inflow, New Mexico	74	39	March-July	
Pecos at Pecos, New Mexico	35	85	March-July	
UPPER COLORADO				
Colorado, Grandby Res. Inflow, Colorado <u>21/</u>	116	51	April-Sept.	
near Dotsero, Colorado <u>22/</u>	645	45	April-Sept.	
near Cameo, Colorado <u>23/</u>	1,100	46	April-Sept.	
near Cisco, Utah <u>24/</u>	836	29	April-July	3,600
Lake Powell Inflow, Arizona <u>25/</u>	1,690	25	April-July	
Roaring Fork at Glenwood Springs, Colorado <u>26/</u>	350	49	April-Sept.	
Uncompahgre at Colona, Colorado	51	38	April-Sept.	

Forecasts in California provided by Department of Water Resources.

Average is for 1958-72 period except California. California is computed for 1921-70 period.

Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.

# SELECTED STREAMFLOW FORECASTS

May 1, 1977

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
UPPER COLORADO (continued)				
Gunnison, Blue Mesa Res. Inflow, Colorado <u>27/</u>	310	39	April-Sept.	
near Grand Junction, Colorado <u>28/</u>	400	34	April-Sept.	
Dolores at Dolores, Colorado	81	35	April-Sept.	
Green at Warren Bridge, Wyoming	155	47	April-Sept.	347
at Green River, Wyoming <u>29/</u>	320	32	April-Sept.	1,222
Flaming Gorge Res. Inflow, Utah <u>27/</u>	310	26	April-July	
at Green River, Utah <u>30/</u>	780	28	April-July	
Big Sandy near Big Sandy, Wyoming	28	49	April-Sept.	62
Yampa at Steamboat Springs, Colorado	125	42	April-Sept.	
near Maybell, Colorado	400	44	April-Sept.	
Little Snake near Dixon, Wyoming	115	38	April-Sept.	254
White near Meeker, Colorado	145	49	April-Sept.	
Strawberry at Duchesne, Utah <u>40/</u>	2.2	5	May-July	
Duchesne near Tabiona, Utah <u>31/</u>	11.8	12	May-July	
at Randlett, Utah <u>40/</u>	2.3	1	May-July	
Lakefork below Moon Lake, Utah <u>32/</u>	15.1	23	May-July	
Uinta near Neola, Utah	15.8	19	May-July	56
Whiterocks near Whiterocks, Utah	10.8	19	May-July	45
Price, Scofield Res. Inflow, Utah <u>33/</u>	4.3	15	May-July	
Cottonwood near Orangeville, Utah <u>34/</u>	8.6	20	May-July	
San Juan, Navajo Res. Inflow, New Mexico <u>27/</u>	191	32	April-July	
near Bluff, Utah <u>35/</u>	233	27	May-July	
Animas at Durango, Colorado	165	39	April-Sept.	
LOWER COLORADO				
Virgin near Virgin, Utah	9.1	33	May-June	
Little Colorado above Lyman, Arizona	-	-	-	
Gila near Solomon, Arizona	-	-	-	
Frisco at Clifton, Arizona	-	-	-	
Salt at Intake, Arizona	17.0	41	May	54
Tonto above Roosevelt, Arizona	0.7	50	May	3
Verde above Horseshoe Dam, Arizona	9.0	89	May	17
GREAT BASIN				
Bear at Utah-Wyo. State Line	37	35	May-July	75
at Harer, Idaho	13	6	May-Sept.	
Smith's Fork near Border, Wyoming	25	22	April-Sept.	135
Thomas Fork near Wyo.-Ida. State Line	6	19	April-Sept.	40
Logan near Logan, Utah <u>36/</u>	27	28	May-July	99
Ogden, Pine View Res. Inflow, Utah <u>27/</u>	11.3	18	May-June	52
Weber near Oakley, Utah	22	24	May-June	80
Provo near Hailstone, Utah <u>37/</u>	22	24	May-July	98
Strawberry Res. Inflow, Utah	1.5	4	May-July	27
Utah Lake Net Inflow, Utah	43	30	May-July	-
Big Cottonwood near Salt Lake City, Utah	9.7	31	May-July	
Beaver near Beaver, Utah	4.2	24	May-July	7.7
Sevier near Hatch, Utah	8.5	25	May-July	22
near Gunnison, Utah	6.0	21	May-July	15
So. Fork Humboldt near Elko, Nevada	12	21	May-July	57
Humboldt at Palisades, Nevada	10	7	May-July	149
Truckee at Farad, California <u>38/</u>	25	13	May-July	199
East Carson near Gardnerville, Nevada	28	19	May-July	150
West Carson at Woodsfords, California	8	20	May-July	41
East Walker near Bridgeport, California <u>39/</u>	4	7	May-August	59
West Walker near Coleville, California	32	25	May-July	129
Donner und Blitzen near Frenchglen, Oregon	16	43	May-July	
Silvies near Burns, Oregon	4	12	May-July	
Chewaucan near Paisley, Oregon	5.3	9	May-July	
Deep above Adel, Oregon	8	19	May-July	
Bidwell near Ft. Bidwell, California	2.2	25	May-July	9
Owens below Long Valley Res., California	8	13	April-July	32

Forecasts in California provided by Department of Water Resources.  
Average is for 1958-72 period except California. California is computed for 1921-70 period.  
Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season

Explanatory Notes on Forecasts Listed on Inside Back Cover



# SELECTED STREAMFLOW FORECASTS

May 1, 1977

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
UPPER COLUMBIA				
Columbia at Birchbank, British Columbia 40/	28,200	65	May-Sept.	50,657
At Grand Coulee, Washington 40/	33,600	54	May-Sept.	73,149
below Rock Island, Washington	37,000	54	May-Sept.	78,541
Kootenai below Libby Dam near Libby, Montana	3,500	50	May-Sept.	7,455
at Leonia, Idaho	4,300	52	May-Sept.	-
Blackfoot near Bonner, Montana	400	44	May-Sept.	905
So.Fk. Flathead nr Columbia Falls, Montana 40/	1,320	62	May-Sept.	2,120
Flathead at Columbia Falls, Montana 40/	3,450	60	May-Sept.	5,785
near Polson, Montana 40/	3,800	56	May-Sept.	6,838
Clark Fork above Missoula, Montana	690	44	May-Sept.	1,586
near Plains, Montana 40/	5,500	49	May-Sept.	11,182
at Whitehorse Rapids, Idaho	6,000	49	May-Sept.	12,349
Bitterroot near Darby, Montana	200	38	May-Sept.	529
Priest near Priest River, Idaho 41/	290	42	May-July	
Pend Oreille below Box Canyon, Washington	5,400	39	May-Sept.	15,035
Kettle near Laurier, Washington	890	55	May-Sept.	
Spokane at Post Falls, Idaho 42/	650	32	May-Sept.	
Similkameen near Nighthawk, Washington	590	41	May-Sept.	1,884
Okanogan near Tonasket, Washington	645	40	May-Sept.	2,004
Methow near Pateros, Washington	380	40	May-Sept.	
Stehekin at Stehekin, Washington	435	48	May-Sept.	
Chelan at Chelan, Washington 43/	575	50	May-Sept.	1,369
Wenatchee at Peshastin, Washington	730	46	May-Sept.	1,960
SNAKE				
SNAKE above Palisades Res., Wyoming 44/	1,020	39	April-Sept.	
near Heise, Idaho 45/	1,350	37	May-Sept.	
near Blackfoot, Idaho 46/	1,490	39	May-July	
at Weiser, Idaho	1,520	30	May-Sept.	
Grey's above Palisade, Wyoming	78	20	April-Sept.	477
Salt above Palisade, Wyoming	70	19	April-Sept.	516
Henry's Fork near Ashton, Idaho 47/	310	54	May-Sept.	
Teton near St. Anthony, Idaho	180	45	May-Sept.	
Big Lost near MacKay, Idaho 48/	25	15	May-Sept.	
Little Lost near Howe, Idaho	10	28	May-Sept.	
Portneuf at Topaz, Idaho	27	41	May-Sept.	
Oakley Res. Inflow, Idaho	6	33	May-Sept.	
Salmon Falls Creek near San Jacinto, Idaho	12	22	May-Sept.	
Little Wood above High 5 Crks, Idaho	10	14	May-Sept.	
Big Wood, Inflow to Magic Res., Idaho 49/	27	13	May-Sept.	
Bruneau near Hot Springs, Idaho	33	20	May-Sept.	
Boise near Boise, Idaho 50/	155	12	May-Sept.	
Owyhee near Owyhee, Nevada 51/	6	15	May-July	41
Owyhee Res. Net Inflow, Oregon 27/	35	22	May-July	172
Malheur near Drewsey, Oregon	5	16	May-July	
Payette near Horseshoe Bend, Idaho 52/	290	19	May-Sept.	
Weiser above Crane Creek, Idaho 40/	45	17	May-Sept.	
Burnt near Hereford, Oregon 40/	2	14	May-July	
Powder near Sumpter, Oregon	8	20	May-July	
Eagle above Skull Creek, Oregon	38	25	May-July	
Imnaha at Imnaha, Oregon	101	40	May-Sept.	
Salmon at Whitebird, Idaho	1,640	26	May-Sept.	
Lostine near Lostine, Oregon	64	55	May-Sept.	
Grande Ronde at LaGrande, Oregon	35	38	May-July	115
Clearwater at Spalding, Idaho	2,000	29	May-Sept.	
LOWER COLUMBIA				
Yakima at CleElum, Washington 53/	320	40	May-Sept.	
near Parker, Washington 54/	300	23	May-Sept.	
Naches near Naches, Washington 55/	225	30	May-Sept.	

Forecasts in California provided by Department of Water Resources.

Average is for 1958-72 period except California. California is computed for 1921-70 period.

Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.

# SELECTED STREAMFLOW FORECASTS

May 1, 1977

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
LOWER COLUMBIA (continued)				
Walla Walla, So. Fork near Milton, Oregon	30	59	May-Sept.	
Umatilla at Pendleton, Oregon	24	35	May-July	
John Day, Middle Fork at Ritter, Oregon	20	30	May-July	
North Fork at Monument, Oregon	109	32	May-July	
Crooked near Post, Oregon	6	19	May-July	
Deschutes at Benham Falls, Oregon 40/	191	68	May-July	
Columbia at The Dalles, Oregon 40/	24,000	40	May-June	62,723
at The Dalles, Oregon 40/	35,000	46	May-July	83,524
at The Dalles, Oregon 40/	43,300	47	May-Sept.	106,435
McKenzie near Vida, Oregon	410	57	May-July	
Santiam, South, at Waterloo, Oregon	183	57	May-July	
North, at Mehama, Oregon 40/	311	63	May-July	
Clackamas at Estacada, Oregon	241	54	May-July	
Willamette at Salem, Oregon 40/	1,600	61	May-July	
Lewis at Ariel, Washington 56/	370	40	May-Sept.	1,001
Cowlitz at Castle Rock, Washington 57/	890	42	May-Sept.	2,369
NORTH PACIFIC COASTAL				
Dungeness near Sequim, Washington	97	65	May-Sept.	
Umpqua, No., near Toketee Falls, Oregon 40/	95	68	May-Sept.	
Rogue at Raygold, Oregon	240	49	May-July	539
Klamath Lake, Net Inflow, Oregon	120	34	May-Sept.	355
Trinity at Lewiston, California	160	26	April-July	370
CALIFORNIA CENTRAL VALLEY 40/				
Sacramento, Inflow to Shasta, California	685	39	April-July	1,135
Feather near Oroville, California	335	18	April-July	565
Yuba at Smartville, California	155	14	April-July	27
American, Inflow to Folsom Res., California	170	13	April-July	312
Cosumnes at Michigan Bar, California	5	4	April-July	15
Mokelumne, Inflow to Pardee Res., California	65	14	April-July	122
Stanislaus, Inflow to Melones Res., California	120	17	April-July	199
Tuolumne, Inflow to Don Pedro Res., California	205	17	April-July	330
Merced, Inflow to Exchequer Res., California	90	15	April-July	168
San Joaquin, Inflow to Millerton Lake, Calif.	185	16	April-July	350
Kings, Inflow to Pine Flat Res., California	195	17	April-July	303
Kaweah, Inflow to Terminus Res., California	40	15	April-July	75
Tule, Inflow to Success Res., California	3	5	April-July	13
Kern, Inflow to Isabella Res., California	65	15	April-July	104
ALASKA				
Yukon at Eagle, Alaska	30,000	86	April-July	35,920
at Ruby, Alaska	70,000	105	April-July	58,420
Porcupine near Fort Yukon, Alaska	8,500	118	April-July	7,100
Salcha near Salchaket, Alaska	500	65	April-July	428
Little Chena near Fairbanks, Alaska	76	82	April-July	69
Chena at Fairbanks, Alaska	700	71	April-July	348
Ship Creek near Anchorage, Alaska	91	159	April-July	59
So.Fk.Campbell at Canyon Mouth nr Anchorage, AK	21.5	162	April-July	12.5

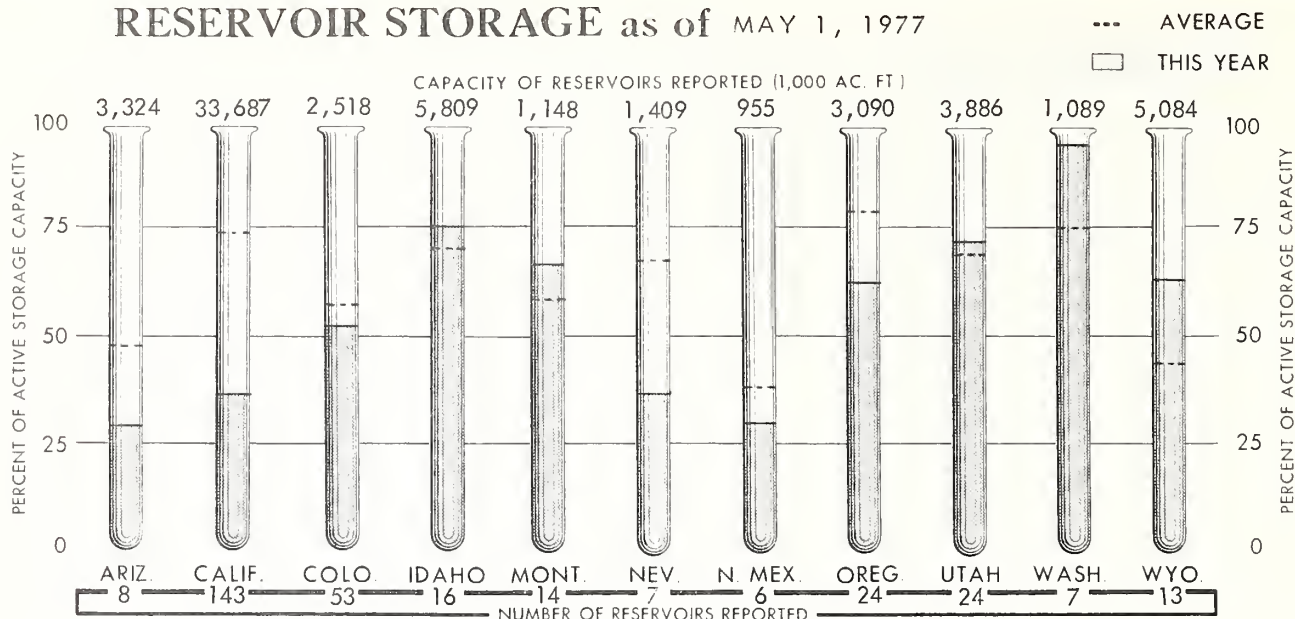
Forecasts in California provided by Department of Water Resources.

Average is for 1958-72 period except California. California is computed for 1921-70 period.

Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts Listed on Inside Back Cover.

# RESERVOIR STORAGE as of MAY 1, 1977



Runoff during April was 20 percent of normal in California, with almost no local runoff occurring in the San Francisco Bay and Central Coastal areas. In the Central Valley, runoff for the water year, October through April, again set record low flows for all streams except the Kern River. Only Lahontan area streams have exceeded 25 percent of normal runoff for the 7-month period.

Reservoir storage in California is 50 percent of the May 1 average. Because snowmelt inflows are far below normal this year, many reservoirs will reach their lowest storage of record and have minimal carryover supplies for 1978. Projected storage for October 1 in Central Valley Project and State Water Project reservoirs is 2,400,000 acre-feet or about 16 percent of total available capacity and 22 percent of the 10-year October 1 average.

## COLORADO

Despite slightly improved snow conditions in some areas, water supply forecasts remain near the minimum of record on all 44 major river basins in Colorado.

Streamflow forecasts on the South Platte and its northern tributaries ranges from a low of 40 percent of normal on the St. Vrain to a high of 47 percent on Boulder Creek at Orodell. All of these forecasts are near the minimum of record. Carryover storage is near normal. Valley soil moisture is reported slightly improved due to a number of showers that developed in the area.

Low elevation snow has melted but stream-flow remains low.

The snowpack along the Front Range was improved slightly during April from the Wyoming state line as far south as Colorado Springs. The storms depositing snow in the high country also provided some rainfall on the plains.

The Arkansas River is expected to flow near the record low year of 1954. Unless spring and summer rainfall is much above normal and falls at optimum times, water supplies will be extremely low. There is practically no chance to improve the snowpack. Carryover storage in Pueblo Reservoir is 54,000 acre-feet. The remaining reservoirs are almost empty. Soil moisture conditions were improved slightly during April.

All possible water conservation is urged this summer. Many areas can get through the summer due to carryover storage, but if the drought should persist into next year, many more problems will become apparent.

Small streams may dry up completely this summer and the larger streams and rivers will have extremely low flows this fall.

## IDAHO

Warm dry weather during the month of April has further aggravated the drought condition throughout Idaho.



# STORAGE IN LARGE RESERVOIRS

BASIN AND NAME OF RESERVOIR	CAPACITY (1,000 A.F.)	STORAGE (1,000 A.F.)	STORAGE PERCENT AVAILABLE	BASIN AND NAME OF RESERVOIR	CAPACITY (1,000 A.F.)	STORAGE (1,000 A.F.)	STORAGE PERCENT AVAILABLE
UPPER MISSOURI				UPPER COLUMBIA			
Belle Fourche	185	124	94	Chelan	676	269	120
Boysen	550	338	183	Coeur d'Alene	225	179	71
Buffalo Bill	373	192	160	Duncan	1,400	114	139
Canyon Ferry	2,043	1,552	100	Flathead	1,791	877	90
Fort Peck	19,140	15,880	118	Hungry Horse	3,428	2,288	114
Garrison	24,790	17,749	121	Kootenay	787	248	66
Hebgen	377	271	127	Lake Koocanusa	5,694	2,291	-
Keyhole	192	135	164	Lower Arrow	2,691	671	463
Lake Francis Case	5,816	4,122	99	Noxon Rapids	335	314	227
Lake Sharp	1,900	1,755	102	Pend Oreille	1,155	419	79
Oahe	23,630	19,290	115	Roosevelt	5,232	1,688	102
Tiber	1,347	492	81	Upper Arrow	4,400	833	192
Bighorn Lake	1,356	888	113	LOWER COLUMBIA			
PLATTE				Cougar	155	86	80
So. Platte in Colo. (30)	1,085	831	100	Detroit	300	194	77
City of Denver (7)	622	425	92	Green Peter	270	219	109
Colo-Big Thompson (3)	718	355	83	Hills Creek	200	61	39
Glendo	784	476	105	Lookout Point	337	131	51
Pathfinder	1,016	723	175	Prineville	153	99	68
Seminole	1,010	528	168	Wickiup	200	183	97
ARKANSAS				Yakima Res. (5)	1,066	975	122
Conchas	273	84	48	SNAKE			
John Martin	621	9	12	American Falls	1,125	991	91
Turquoise	130	39	-	Anderson Ranch	423	340	121
RIO GRANDE				Arrowrock	287	17	7
Elephant Butte	2,195	352	93	Brownlee	980	697	182
New Mexico Res. (4)	571	185	150	Cascade	653	355	100
UPPER COLORADO				Dworshak	2,016	1,029	317
Blue Mesa	830	366	117	Jackson	847	647	129
Flaming Gorge	3,749	2,638	162	Lucky Peak	278	261	183
Navajo	1,636	1,092	-	Owyhee	715	485	86
Powell	25,002	18,127	-	Palisades	1,200	1,126	145
Starvation	165	165	-	Warm Springs	191	73	52
LOWER COLORADO				PACIFIC COASTAL			
Havasu	619	595	101	Clair Engle	2,448	1,035	47
Mead	26,159	20,622	122	Clear Lake	440	195	73
Mohave	1,810	1,755	104	Nacimiento	350	44	20
Salt River Res. (4)	1,755	899	76	Ross	1,404	540	72
San Carlos	1,093	3	14	Upper Klamath	584	454	88
Verde River Res. (2)	318	23	14	CALIFORNIA CENTRAL VALLEY			
GREAT BASIN				Almanor	1,308	643	78
Bear	1,421	1,050	101	Berryessa	1,602	944	61
Deer Creek	250	100	96	Bullards Bar	930	289	44
Lahontan	291	174	79	Folsom	1,010	298	41
Rye Patch	157	105	98	Isabella	570	66	32
Sevier Bridge	236	114	100	McClure	1,026	207	30
Strawberry	274	211	164	Millerton	521	218	60
Tahoe	732	123	26	Oroville	3,484	1,407	46
Utah	884	798	119	Pine Flat	1,013	339	51
Willard Bay	193	149	92	Shasta	4,500	1,214	29

Reservoir Storage Data Provided by Bureau of Reclamation, Corps of Engineers, Geological Survey, and water using organizations. Data from California and British Columbia provided by Department of Water Resources and Department of Lands, Forests and Water Resources, respectively.

Water supplies will be deficient throughout the state during 1977. Critical shortages will be experienced in many areas, particularly the south central and southwestern sections. Many small streams are expected to be dry by next fall. Seasonal runoff forecasts range from a low of 6 percent of average for the Bear River at Harer to a high of 54 percent of normal for the Henry's Fork at Ashton. Record lows are forecast for practically all watersheds in the state.

The winter snow accumulation has disappeared on all watersheds except at very high elevations and in protected areas. The melting snow produced minimal runoff on all drainages, setting new minimum April flow records at many gauging stations.

Stored water, though near average in many reservoirs, will be insufficient to supply irrigation demands for the coming season. Due to streamflow and early drawdown for irrigation, reservoirs will not fill this year. Some smaller reservoirs are already empty.

Precipitation during April averaged less than 20 percent of normal over most of the state with a significant portion of south central and southwestern Idaho receiving less than 10 percent of average. Mean temperatures for the month were 2 to 5 degrees above normal.

## MONTANA

Snowfall and precipitation were below average during April. Snowmelt is occurring at most elevations. Snow at many snow courses has completely melted and many streams have already or are in the process of reaching their peak snow melt runoff.

Dry soils have absorbed much of this early snowmelt. Streamflow levels will be much lower than normal for the remainder of the season. Irrigation water supplies from natural streamflow will be in short supply by mid-June on many streams.

Snowpack conditions deteriorated during the past 30 days. Many snow courses are bare - the earliest date this has occurred in the state. Early season runoff has been below average in most areas and is as low as 40 percent of the April normal.

Most streams in the Clark Fork drainage are forecast to have the lowest or near lowest runoff of record for the next five months. Runoff in the Flathead is expected to be slightly greater than the low years of the early 1940's.

Inflow to Clark Canyon reservoir is forecast to be less than 10 percent of average for the next five months. Most other Missouri River streams are forecast between 30 and 60 percent average runoff. Exceptions are streams in central Montana where streamflow should be 80 to 90 percent of average.

Most streams in the Yellowstone drainage are forecast to have the lowest or near lowest runoff of record. Many smaller streams have already reached their peak snowmelt runoff. The major streams are expected to reach their peak snowmelt runoff by mid-May.

Irrigation water will be in short supply by mid-June on smaller tributaries and by late June or early July on larger streams.

## NEVADA

Snow surveys taken about May 1 indicate there is very little snow in the Sierras and most areas in Nevada. Of the 64 snow courses surveyed only 24 had measurable snow. Most courses had less than 20 percent of average snow water while some were below 10 percent.

This year's snowpack has been one of the poorest since snow survey records began in 1910.

Streamflow forecasts indicate minimum flows should be expected on all streams. Streamflow measurements for April denote many have probably reached their peak. This is 4 to 6 weeks earlier than normal. Water diversions are being made to only those with greatest seniority water rights.

Streamflow forecasts for the May 1 - July 31 period are below 25 percent of average on the Sierra streams. Most will be a minimum record if they occur. Humboldt and Owyhee drainage streamflow forecasts are slightly below last month's and most streams appear to have reached their peak flows during April.

Water storage in seven major reservoirs represents only 55 percent of average. Lake Tahoe contains 123,000 acre-feet equaling 26 percent of the 1958-72 average.

## NEW MEXICO

The outlook for water supplies in New Mexico remains poor. In some basins the flows may become critical enough to warrant rationing for municipal, recreational and industrial use, in addition to agriculture. As a result of the extremely dry winter, some streams will flow at or below minimum of record.

Melting of the mountain snowpack has progressed rapidly in most areas. Precipitation during the third week of April helped to improve soil moisture, but no significant changes in water supplies are forecast. The Rio Grande and its major tributaries are expected to flow at or below previous minimums which is about 40 percent of normal. Streams originating in the Sangre de Cristo Range should be slightly better. Storms during the third week of April added some snow to higher elevations and rain at lower elevations which helped to improve soil moisture. Water users with direct diversion will be hurt the most.

## OREGON

Oregon water users will experience extreme water shortages this next summer. Only water users with access to stored supplies will have normal to below normal amounts of water for irrigation. Users dependent upon direct diversion are expected to have very poor supplies during the water-use season.

The mountain snowpack is very poor for May 1. The only snow left is in the high Wallowa's of northeast Oregon and along the crest of the Cascades. This condition does not normally occur until June 1 to June 15. Of 68 key snow courses that normally have snow on May 1, 63 equalled or set new minimum record water contents. Forty-three courses were completely bare of snow. Percentages of normal were 0 to 15 percent on eastern Oregon watersheds and 0 to 35 percent in the Cascades.

April was very dry in most of Oregon. Precipitation amounts ranged from 15 to 65 percent in eastern Oregon. The area around John Day received good showers during the month. Western Oregon precipitation was 45 percent of normal. Precipitation since November has been 20 to 40 percent of average. This has been one of the very driest years experienced in the state. Soil moisture is still below average in the mountain watersheds, even after the snowmelt which occurred last month. This factor will detract from any additional runoff which would occur from spring rains.

Streamflow during the May through September period is forecast to be much below normal. The Owyhee is expected to yield only 20 percent of average. Other representative figures includes the Malheur, 17 percent; the Grande Ronde, 38 percent; the Silvies, 12 percent; the Willamette, 52 percent; and the Deschutes, 68 percent of normal.

Twenty-four principal irrigation reservoirs were storing 1,941,000 acre-feet on May 1. This is 79 percent of average and 63 percent of capacity. Reservoir levels will begin to drop as releases are made for water use and irrigation.

## UTAH

The winter of 1976-77 in Utah has established itself as the driest on record, and the spring runoff months point toward producing the lowest streamflows since the drought years of 1934. It is feared that many areas of the state will face water shortages not experienced that dry year.

Premature melting of snow on the high watersheds and complete melting of all snow at low elevations was recorded on this month's surveys.

Only 27 percent of the courses measured had any snow, and only two of 134 recorded snow above the previous minimums. State-wide, only 9 percent of an average May 1 snow remains.

The best snow cover in the state was measured in the Upper Green River Basin, and it was only 28 percent of average. Snow courses on the north slope of the Uintahs measured as high as 47 percent of the May 1 average water content.

Precipitation measurements indicate accumulation for the month from 80 percent of average at Burnt Creek down to 4 percent at Big Flat in the Beaver River drainage and some had no precipitation at all.

Dry soils continued to be a concern. With the bare, dry conditions of watershed soils, absorption rates from melt have been high, and will materially reduce the effects of spring rains on runoff.

Storage in 24 key reservoirs is now 105 percent of the May 1 average and 17 percent less than last year. Water is already being used from reservoirs because streamflow has already peaked at near record low levels.

Spring and summer streamflow forecasts are lowered this month as a result of continued warm, dry weather. Prospects for record low flows exist throughout the state. Many streams will produce less flow this year than was recorded in the 1934 drought year.

The Bear is forecast to yield only 6 percent of normal; the Sevier, 10 percent;



Parleys Creek, 12 percent; Lake Fork, 23 percent; Weber, 24 percent; Logan, 28 percent; and Utah Lake inflow is expected to be 30 percent of average. Most of these flows are below that received in 1934. Rainfall this coming summer must be well above normal to avoid the severe shortages as experienced in 1934.

## WASHINGTON

The water supply outlook for Washington has worsened from that which was forecast one month ago. The snowpack melted very rapidly during the past month and snow cover now ranges from a high of 49 percent of normal to a low of 7 percent. Many of the snow courses that normally have measureable amounts of snow as of May 1, are totally bare and only the highest elevation snow courses are reported to have any snow cover at all. Conditions are somewhat better in the northern portion of the Columbia Basin in British Columbia. Some local drainages in this area are near normal.

As a result of the poor snow cover and extreme lack of precipitation input during April, water supply forecasts have all been revised downward from last month--some as much as 15 to 20 percent.

Most irrigation reservoirs are in good shape, ranging from 56 to 101 percent of capacity, but power reservoir storage is low and not expected to fill this spring.

## WYOMING

April showers failed to materialize in the southwest portion of the state and severe drought conditions persist. The

warm temperatures in April have melted most of the snow, but due to the dry soil conditions, very little runoff has occurred.

An unusually warm April has depleted all of the low elevation snow and significantly reduced the high elevation snowpack. With the exception of the northern portion of the Bighorn Mountains, the entire state is below normal with most of the Continental Divide having less than 10 percent of the normal water content for May 1.

The dry spell continued through April on the west side of the state with the Snake and Yellowstone drainages receiving only 10-30 percent of the normal amount. Precipitation was near normal in the northeast and above average in the southeast. The seasonal totals range from one-third to one-half of average in the west to slightly above normal along the east side of the state.

Streamflow forecasts range from 80 percent below normal in the southwest to near average in the northeast. Many streams are at or past the peak runoff and beginning to recede. Record low flows can be expected on most streams in the southwest.

Reservoir storage remains above the May 1 average throughout the state, but with the low streamflow volumes, some of the major reservoirs in the state will not fill this year.



# EXPLANATION of STREAMFLOW FORECASTS

All flows are observed flows except as adjusted for: 1/ Storage change in Lake Sherburne. 2/ Storage change in Lima and Clark Canyon reservoirs. 3/ Storage change in Hebgen Lake. 4/ Storage change in Gibson Reservoir and measured diversions. 5/ Storage change in Two Medicine, Four Horns, Lake Francis and Swift reservoirs. 6/ Storage change in Canyon Ferry and Tiber reservoirs. 7/ Changes as indicated in (6/), (8/), plus storage change in Fort Peck. 8/ Storage change in Boysen, Buffalo Bill, Bull Lake and Yellowtail reservoirs. 9/ Storage change in Buffalo Bill Reservoir plus Heart Mountain diversion. 10/ Storage change in Pilot Butte and Bull Lake reservoirs plus Wyoming canal diversion.

11/ Changes indicated in (10/) plus storage change in Boysen Reservoir. 12/ Plus diversions to Cache LaPoudre. 13/ Plus by-pass to power plants. 14/ Minus diversion thru Gumlick Tunnel. 15/ Storage change in Price Reservoir. 16/ Minus diversions from North Platte, Laramie and Colorado rivers plus measured diversions above station. 17/ Storage change in Clear Creek, Twin Lakes and Turquoise reservoirs minus diversions from Colorado River. 18/ Storage change in Rio Grande, Santa Maria and Continental reservoirs. 19/ Storage change in El Vado and Abiquiu reservoirs. 20/ Storage change in Platoro Reservoir.

21/ Storage change in Grandby Reservoir as furnished by U.S.B.R. plus diversions by Adams Tunnel and Grand River Ditch. 22/ Changes as indicated in (21/) plus diversions thru Roberts, Gumlick and Moffat tunnels and storage change in Dillon, Homestake, Williams Fork, Green Mountain and Willow Creek reservoirs. 23/ Changes indicated in (22/) and (26/). 24/ Storage change in Blue Mesa Reservoir. 25/ Changes indicated in (24/), (30/) and (35/) and storage change in Lake Powell. 26/ Diversions to Arkansas River plus storage change in Ruedi Reservoir. 27/ (Inflow record as computed by U. S. Bureau of Reclamation.) 28/ Storage change in Taylor, Blue Mesa and Morrow Point reservoirs. 29/ Storage change in Fontenelle Reservoir. 30/ Storage change in Flaming Gorge Reservoir.

31/ Plus diversion through Duchesne Tunnel. 32/ Storage change in Moon Lake Reservoir. 33/ Storage change in Scofield Reservoir. 34/ Storage change in Joe's Valley Reservoir. 35/ Storage change in Navajo Reservoir. 36/ Plus U. P. & L. Co. tailrace and Logan, Hyde Park and Smithfield canals. 37/ Minus diversions thru Duchesne Tunnel and Weber-Provo Canal. 38/ Storage change in Lake Tahoe and Boca reservoirs (Forecast by Truckee Basin Committee.) 39/ Storage change in Bridgeport Reservoir. 40/ Corrected for major upstream impairments -- represents simulated natural flow conditions.

41/ Storage change in Priest Lake. 42/ Storage change in Coeur d'Alene Lake and diversions by Spokane Valley Farms Co. and Rathrum Prairie canals. 43/ Storage change in Lake Chelan. 44/ Storage change in Jackson Lake. 45/ Storage change in Jackson Lake and Palisade reservoirs. 46/ Storage change in Jackson Lake, Palisades, Island Park, Henry's Lake, Grassy Lake plus diversions between Heise and Blackfoot. 47/ Storage change in Henry's Lake and Island Park reservoirs. 48/ Storage change in MacKay Reservoir and diversion in Sharp Ditch. 49/ Combined flow Big Wood near Bellevue and Camas Creek near Blaine. 50/ Storage change in Arrowrock, Anderson Ranch and Lucky Peak reservoirs.

51/ Storage change in Wild Horse Reservoir. 52/ Storage change in Cascade and Deadwood reservoirs. 53/ Storage change in Keechelus, Kachess and CleElum reservoirs plus diversion by Kittitas Canal. 54/ Changes indicated in (52/) plus storage change in Bumping and Rimrock Lakes plus diversion by Roza, Union Gao, New Reservation, Old Reservation and Sunrise canals. 55/ Storage change in Bumping and Rimrock lakes and diversions by Tieton, Selah Valley, Wapatox canals and City of Yakima. 56/ Storage change in Merwin, Yale and Swift reservoirs. 57/ Storage change in Mayfield Reservoir.

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